

FIG 1  
(Stand der Technik)  
Prior Art

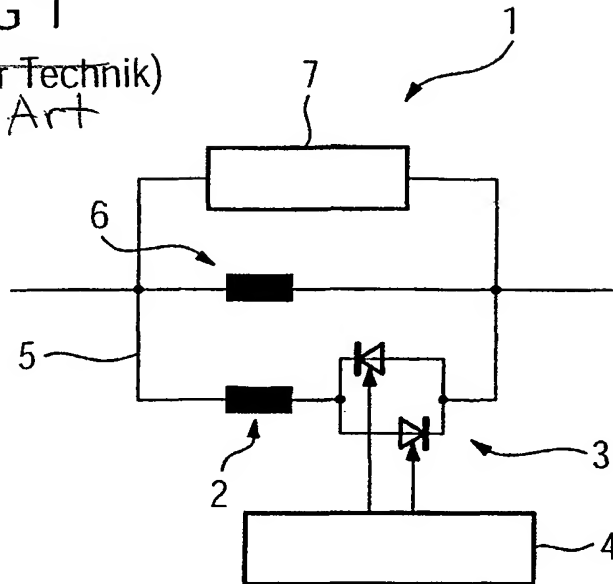


FIG 2

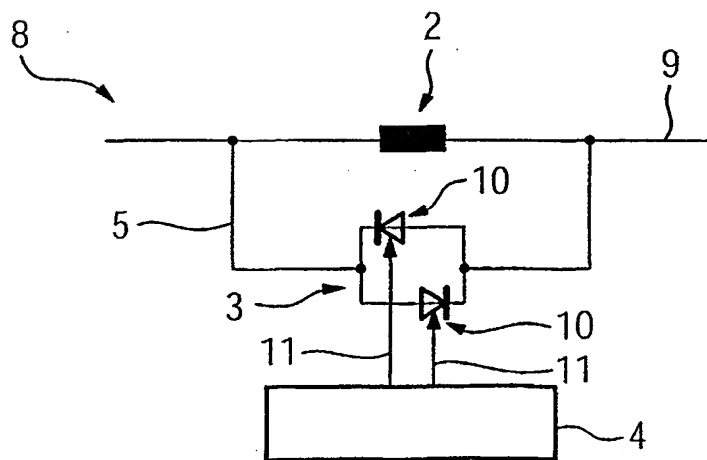


FIG 3a

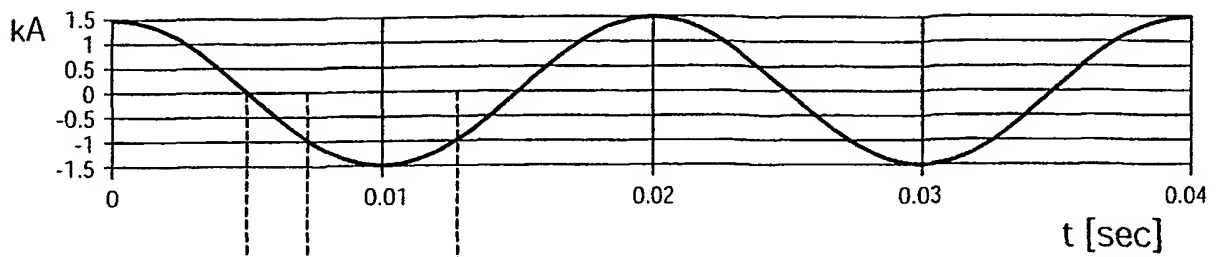


FIG 3b

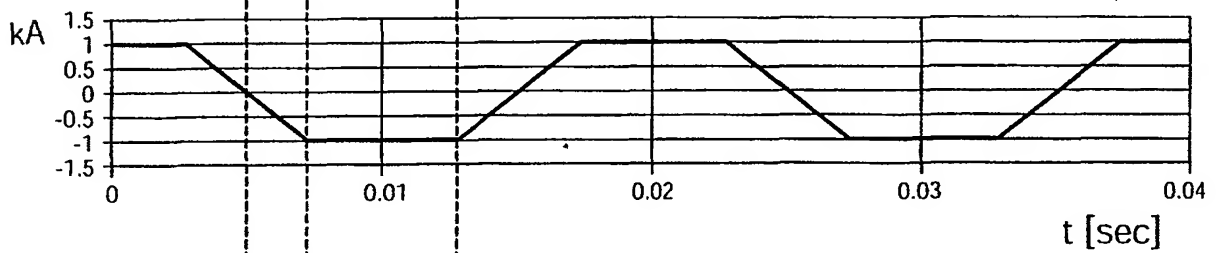


FIG 3c

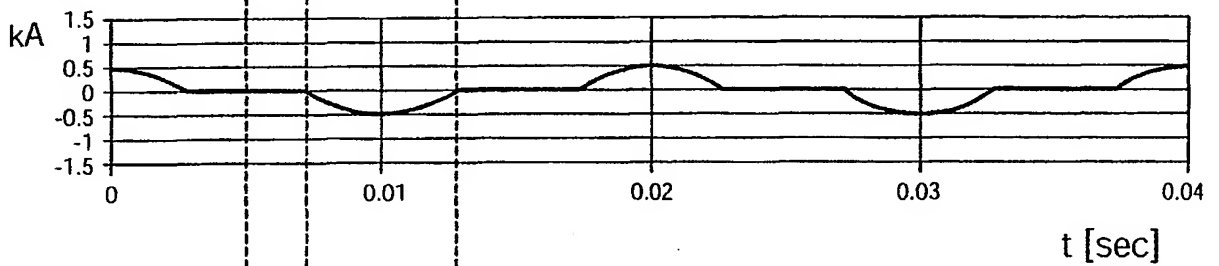


FIG 3d

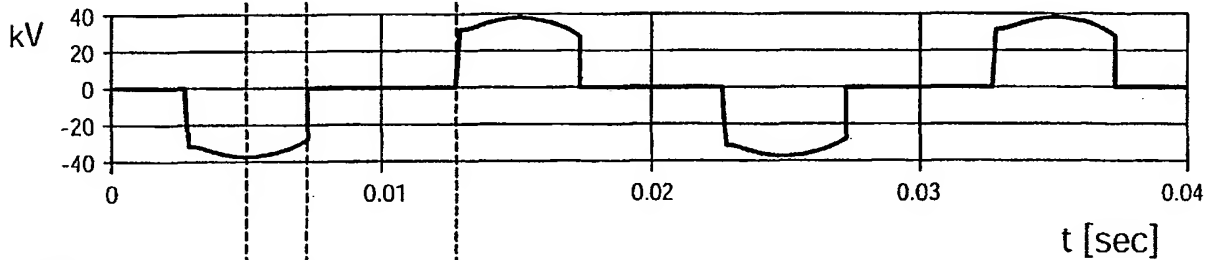


FIG 3e

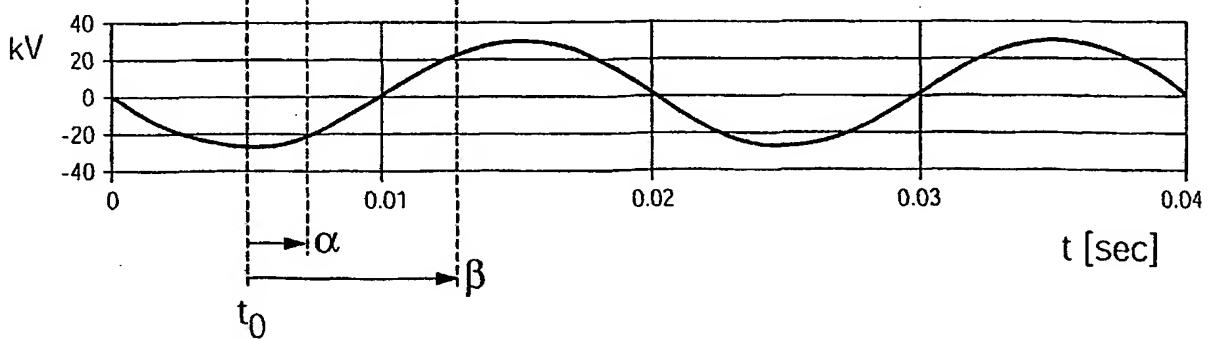


FIG 4

$X_{\text{SUM}} / X_{\text{RSP}}$

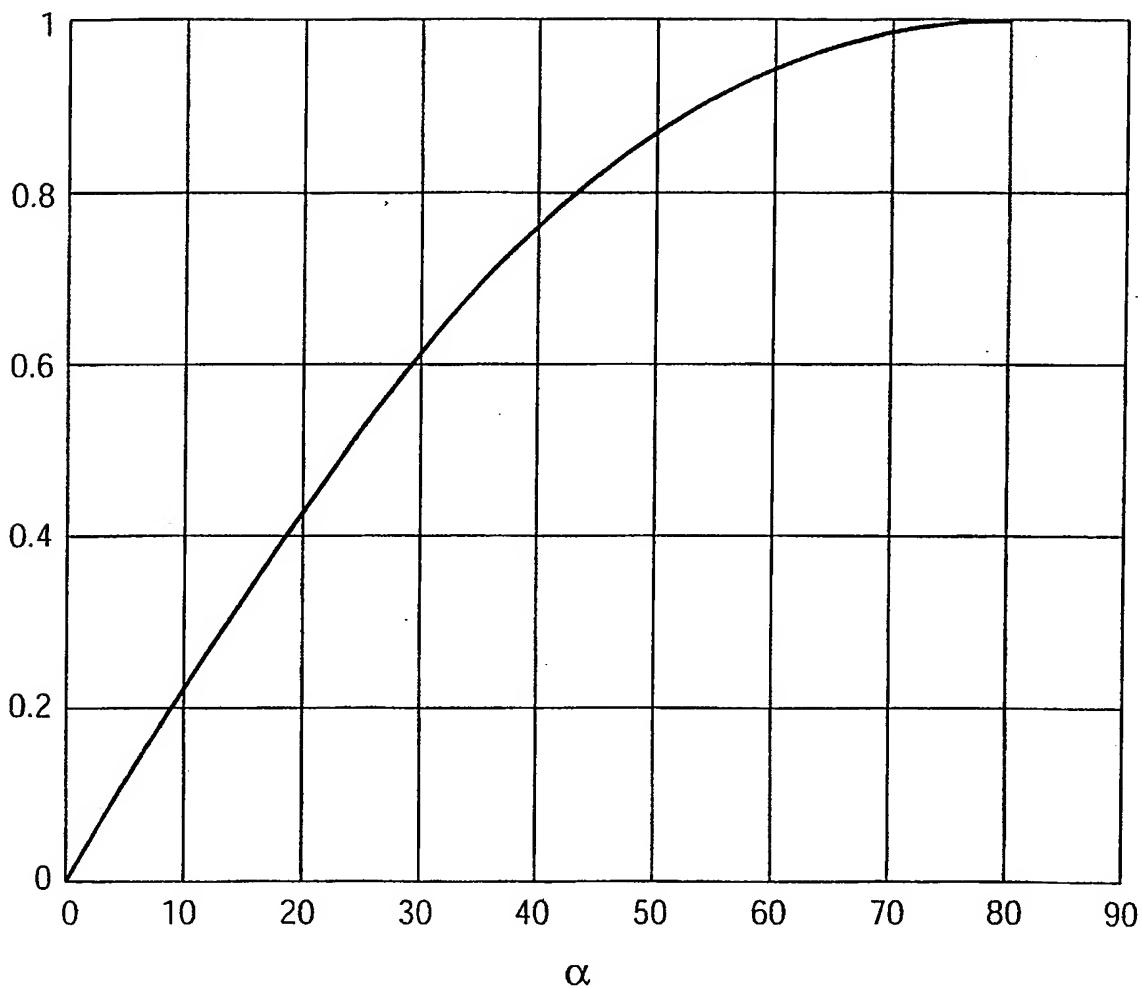


FIG 5a

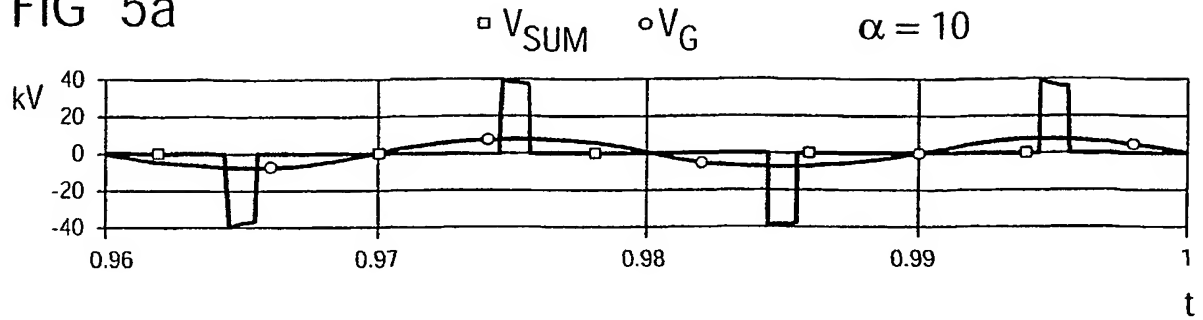


FIG 5b

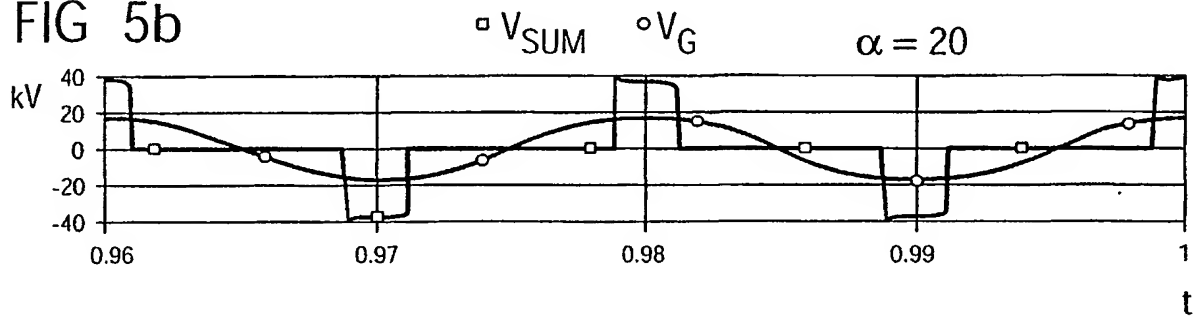


FIG 5c

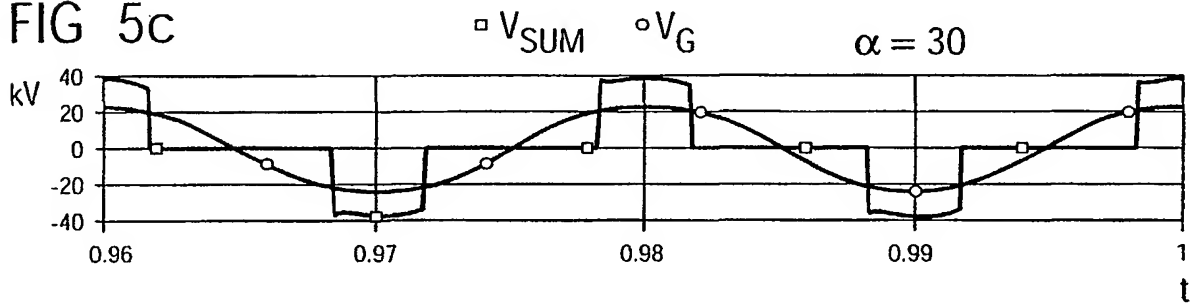


FIG 5d

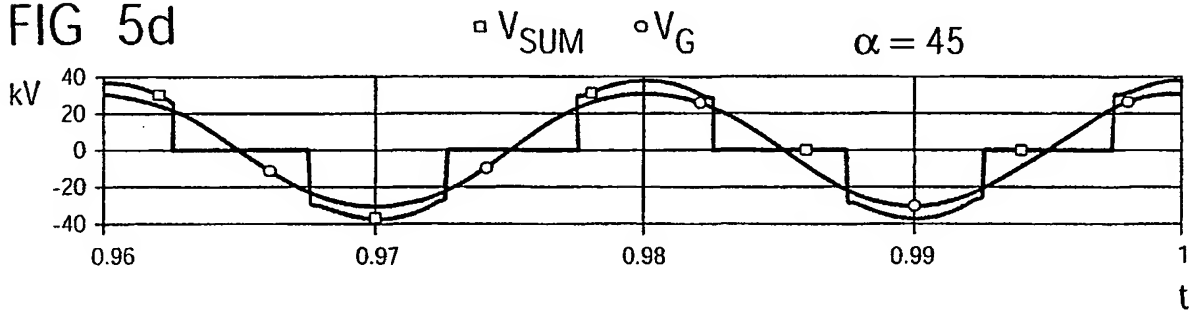
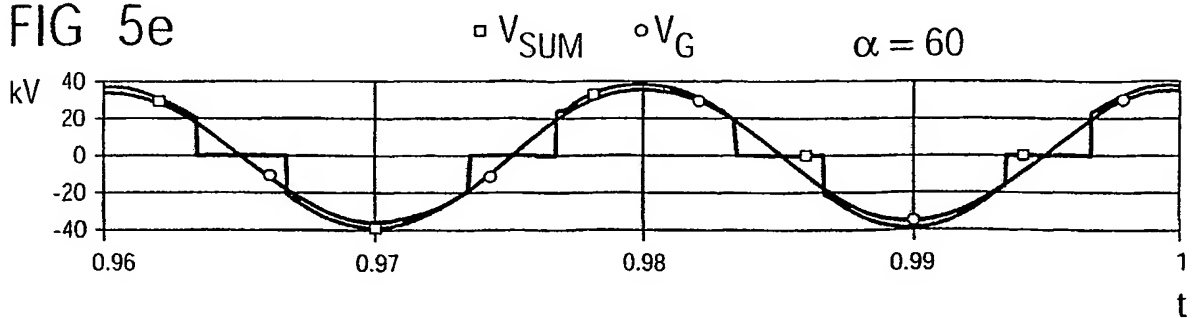


FIG 5e



Device For Adjusting The Impedance  
Of A High Voltage Line Supplying  
An Alternating Current

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Attorney Docket.: 071308.0692

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FIG 6a

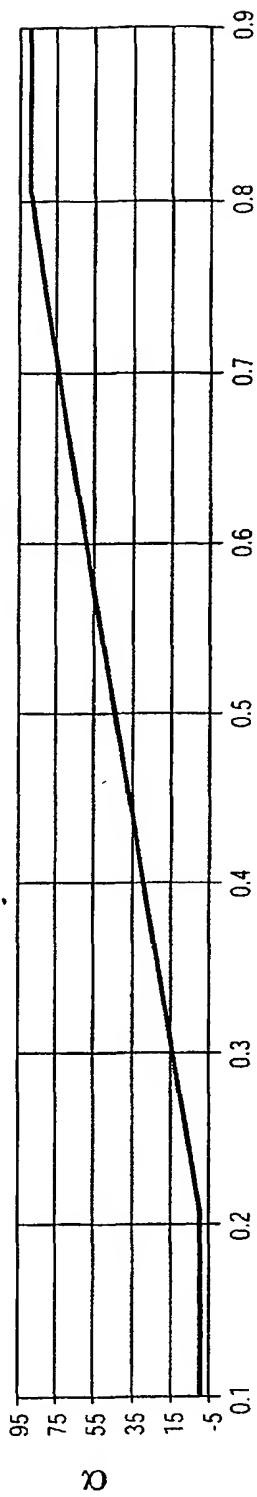


FIG 6b

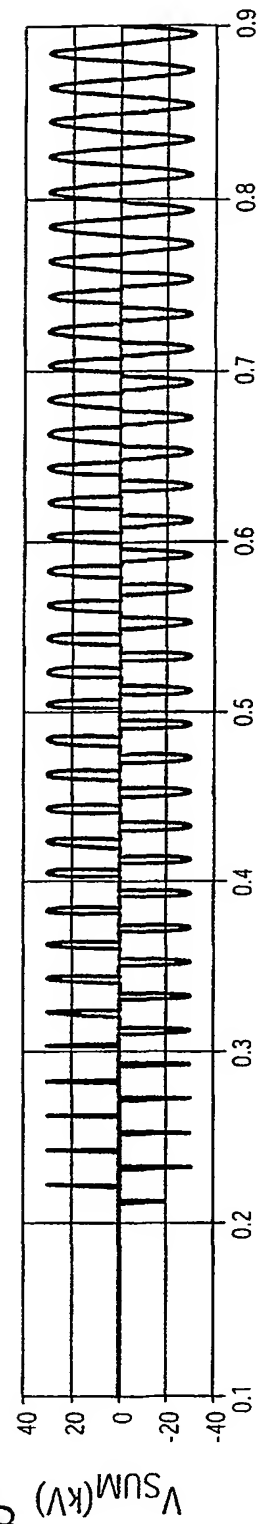


FIG 6c

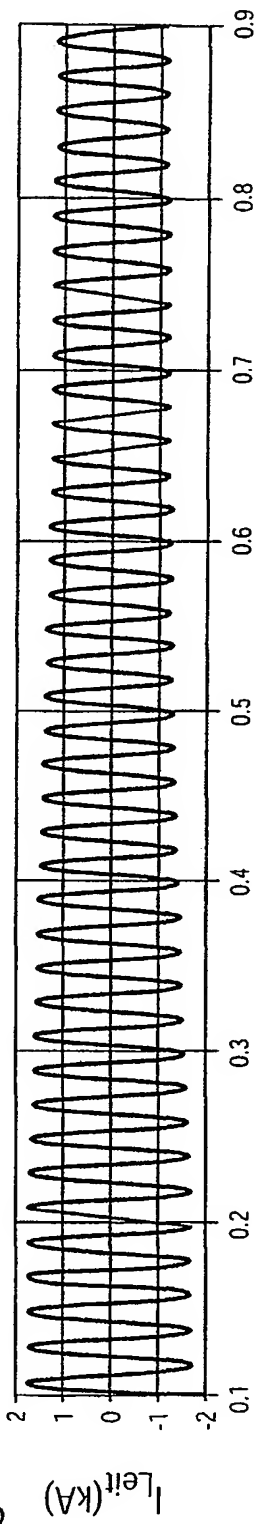


FIG 6d

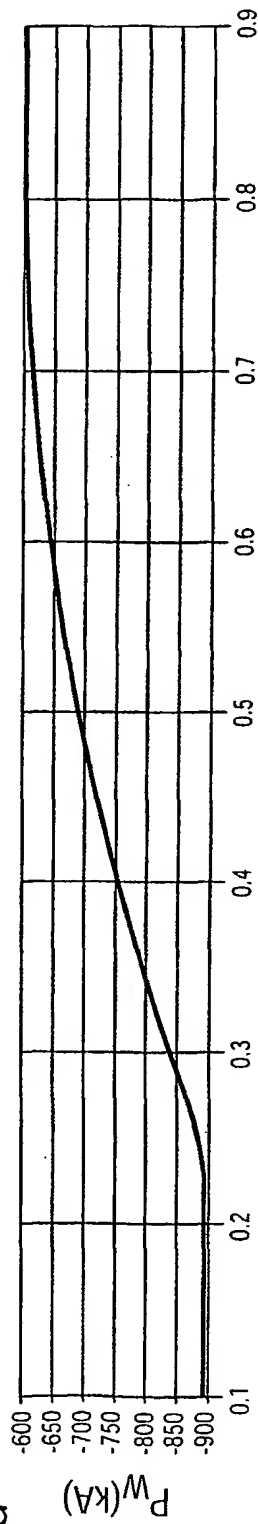


FIG 7

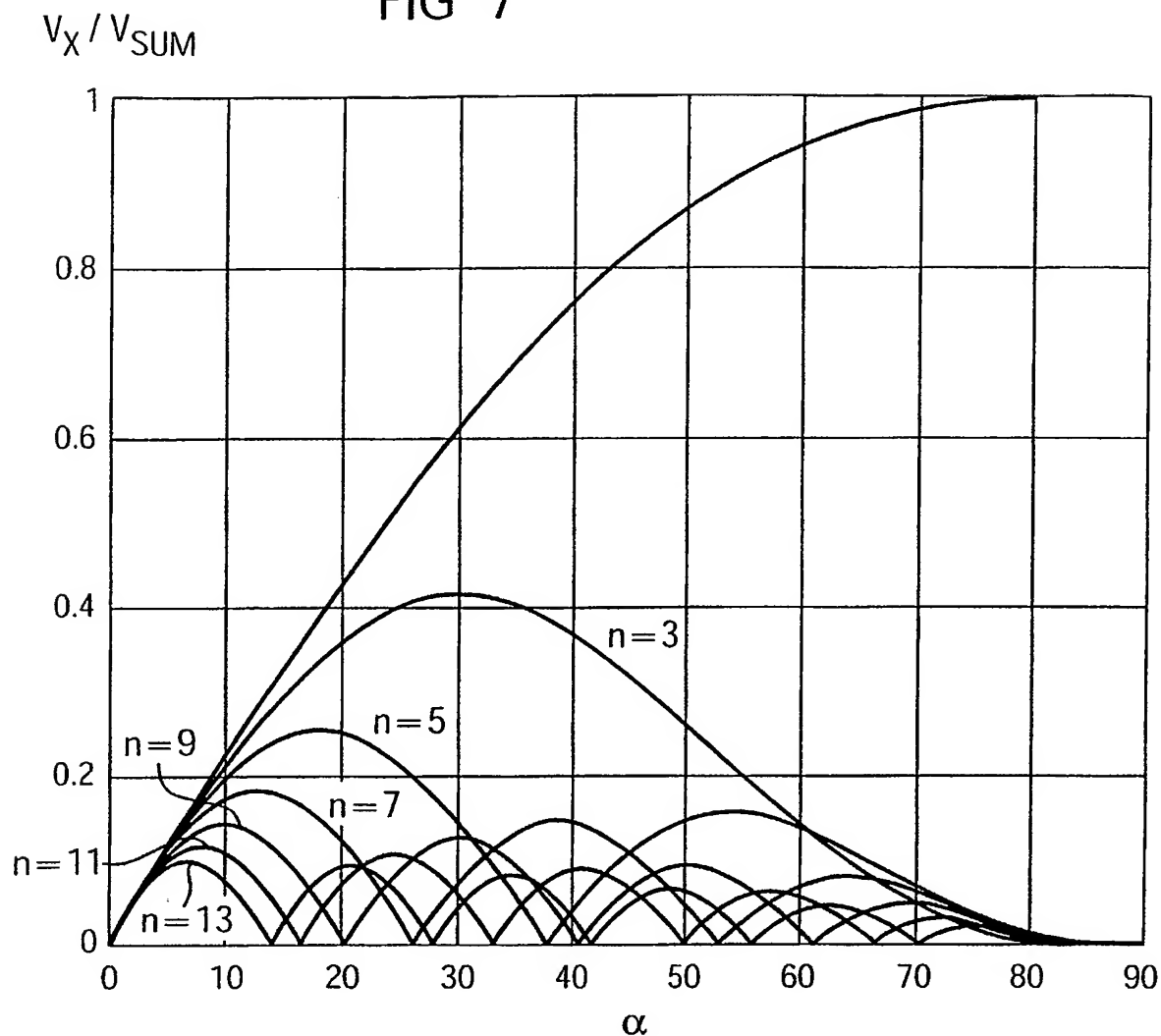


FIG 8

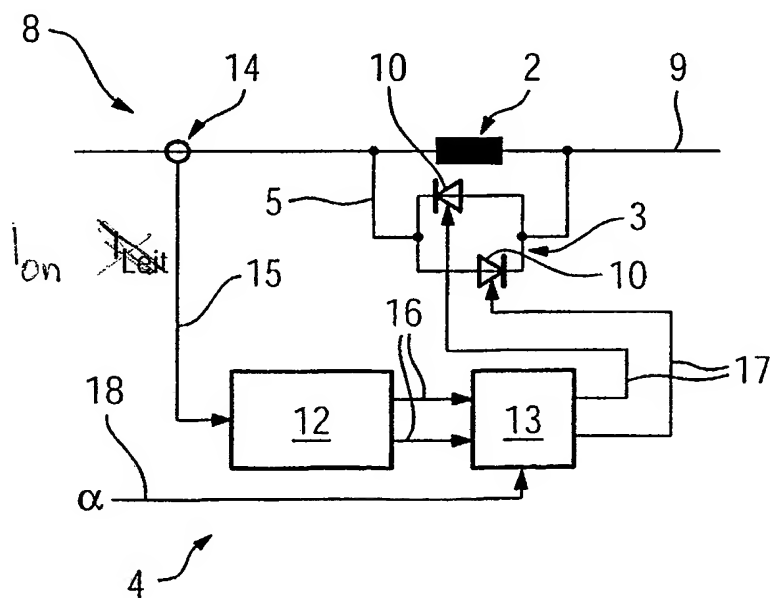


FIG 9

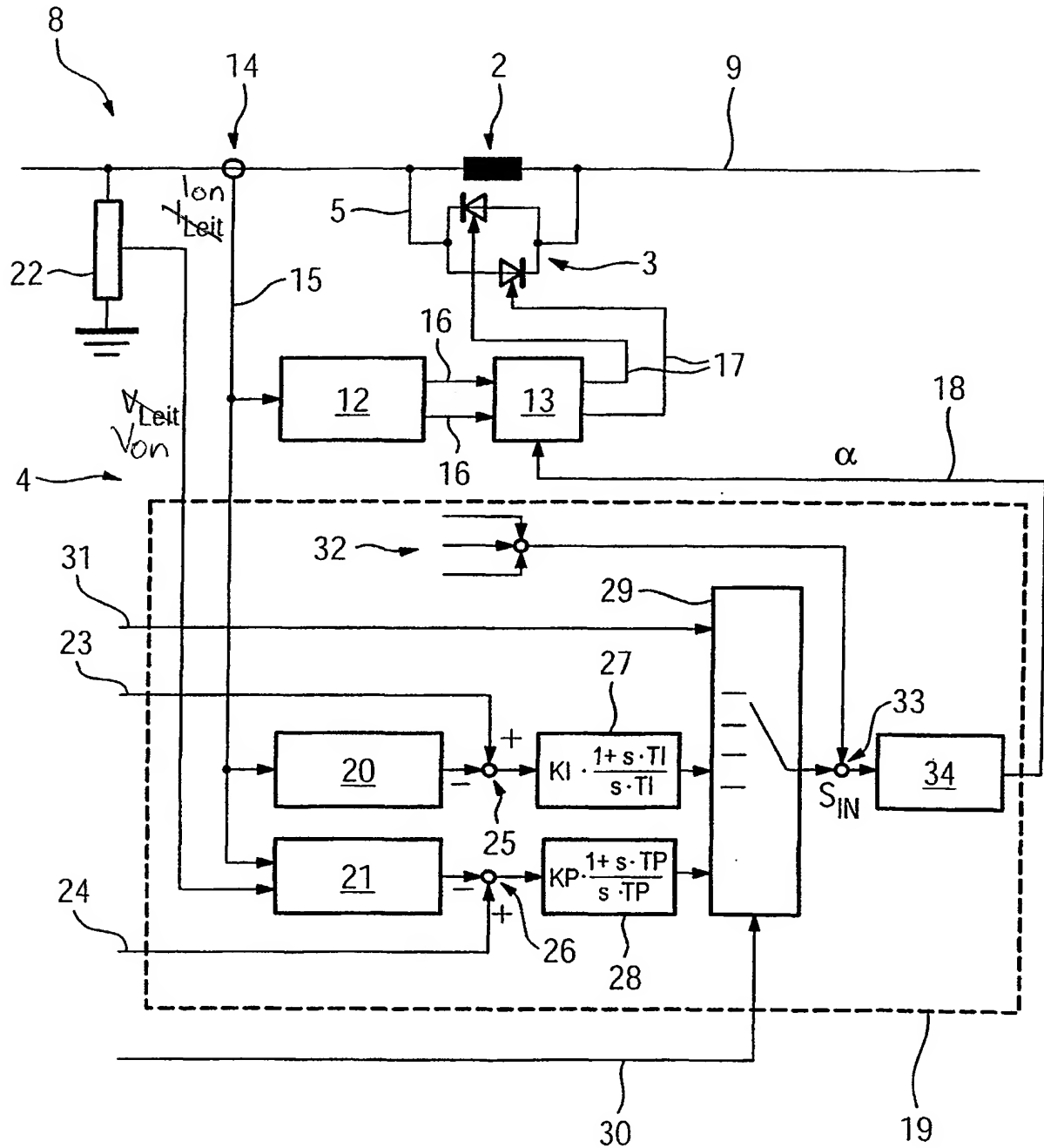


FIG 10

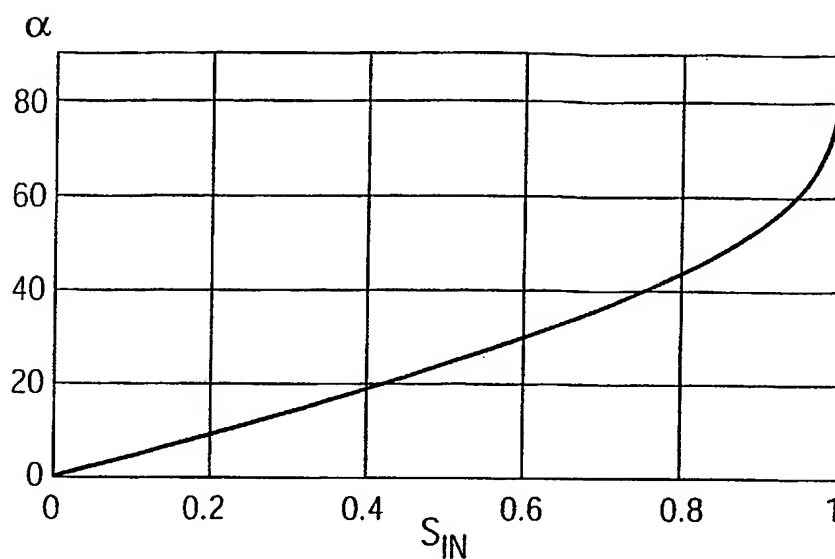


FIG 11

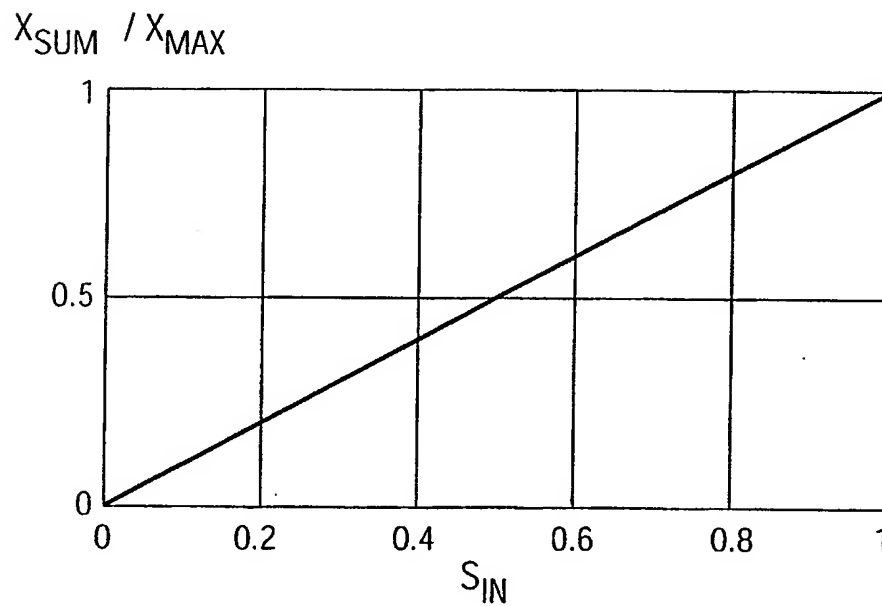


FIG 12

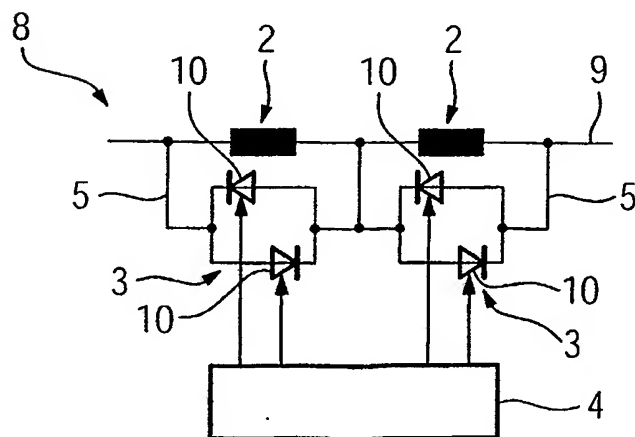




FIG 13

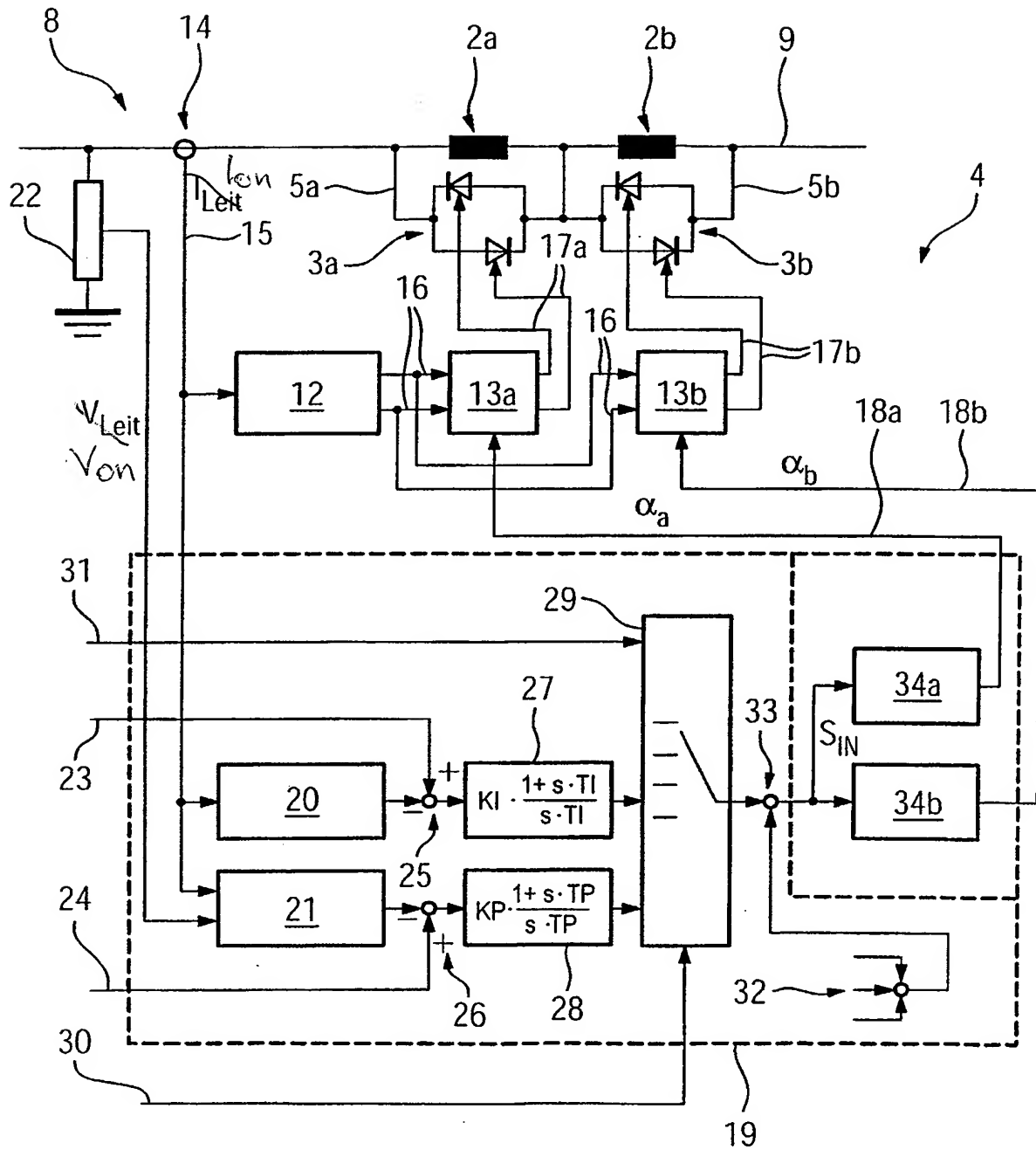


FIG 14

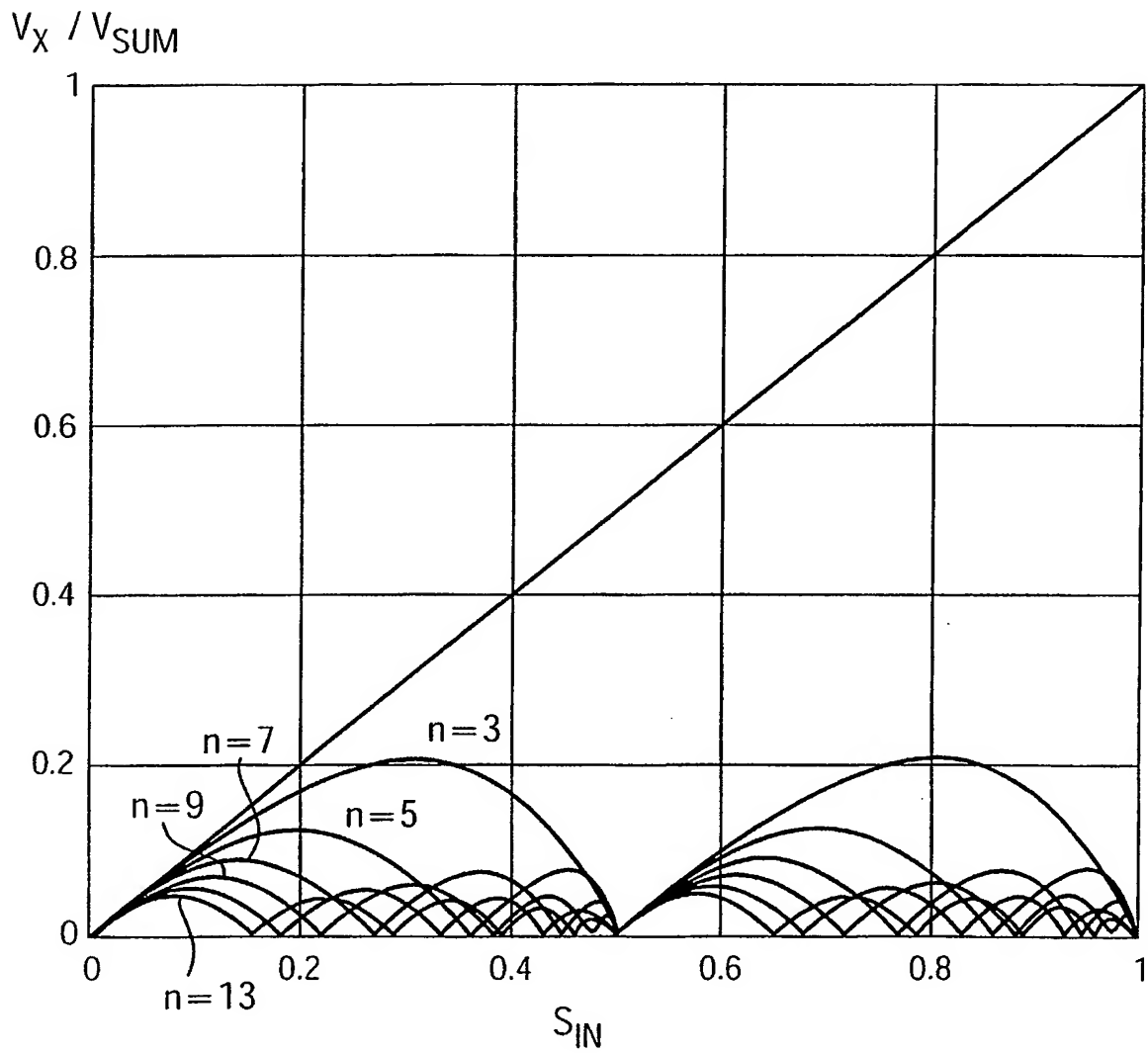


FIG 15a

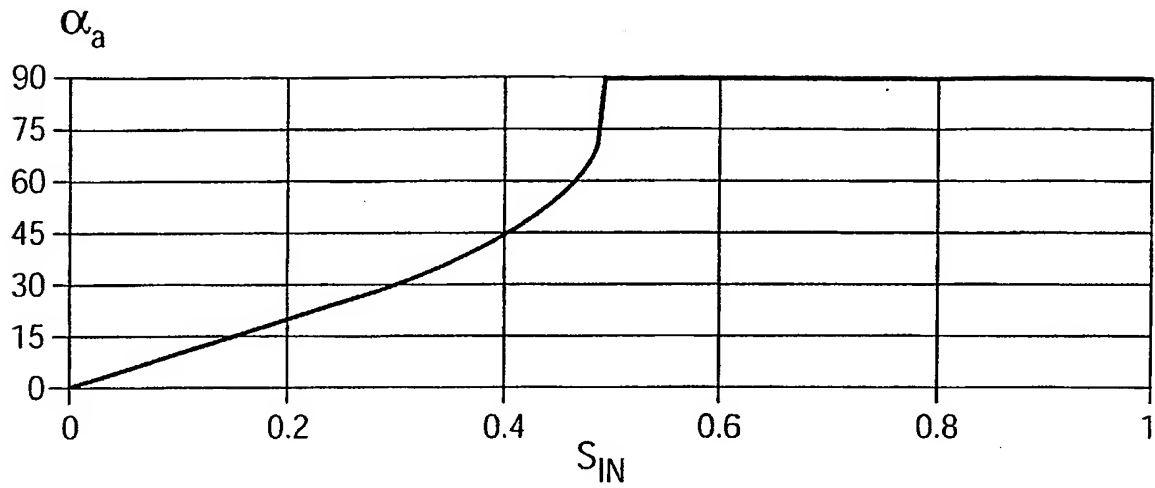


FIG 15b

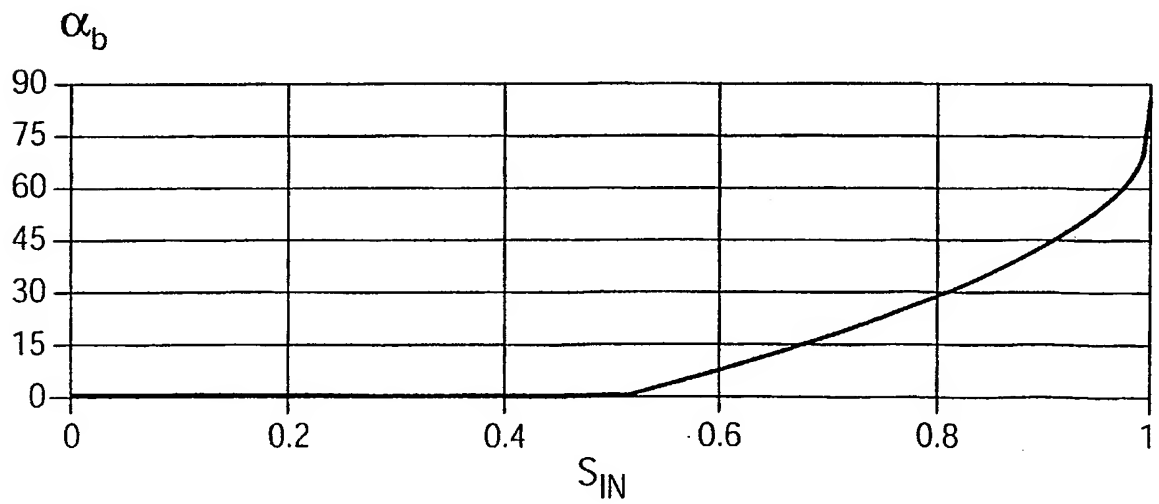


FIG 16

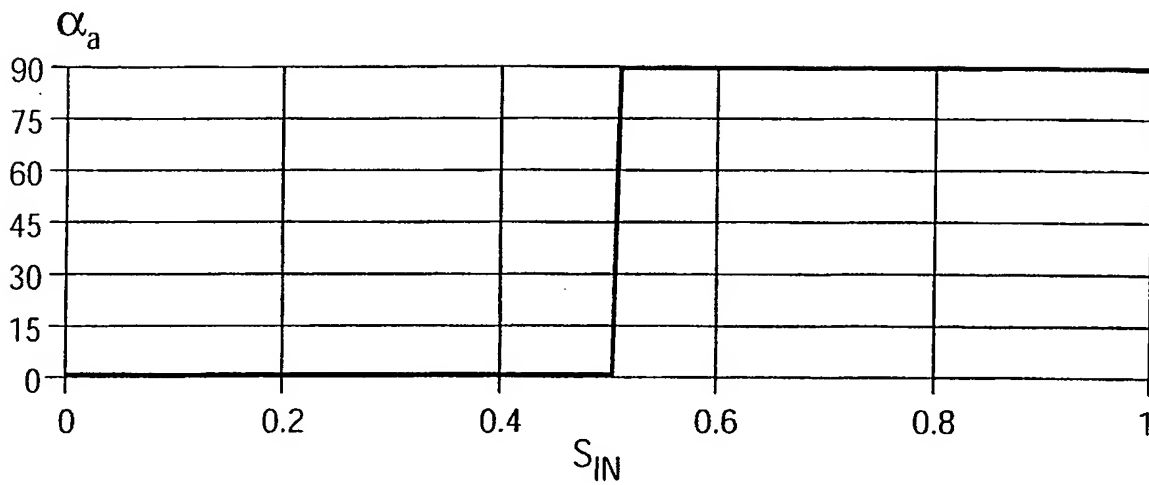


FIG 17

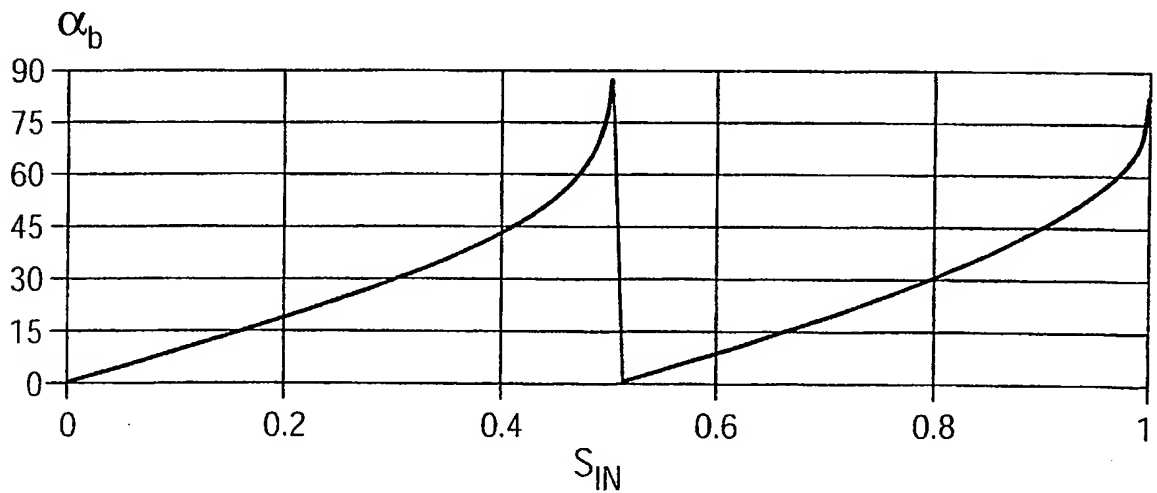


FIG 18

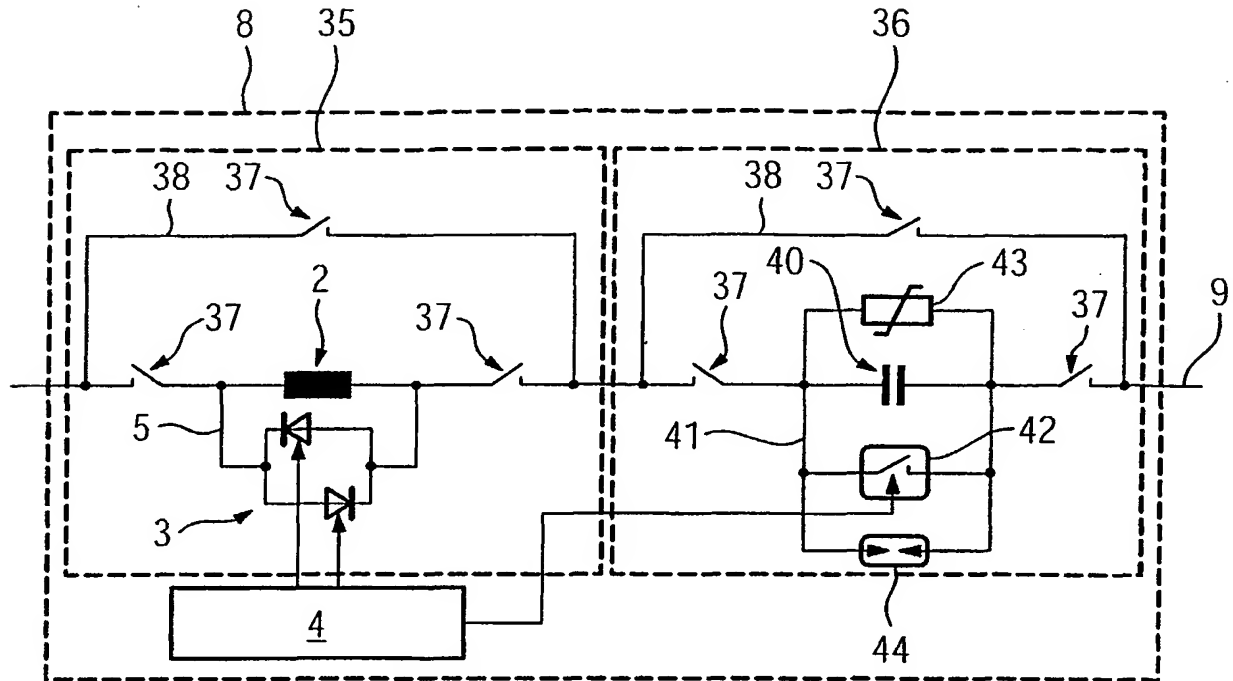
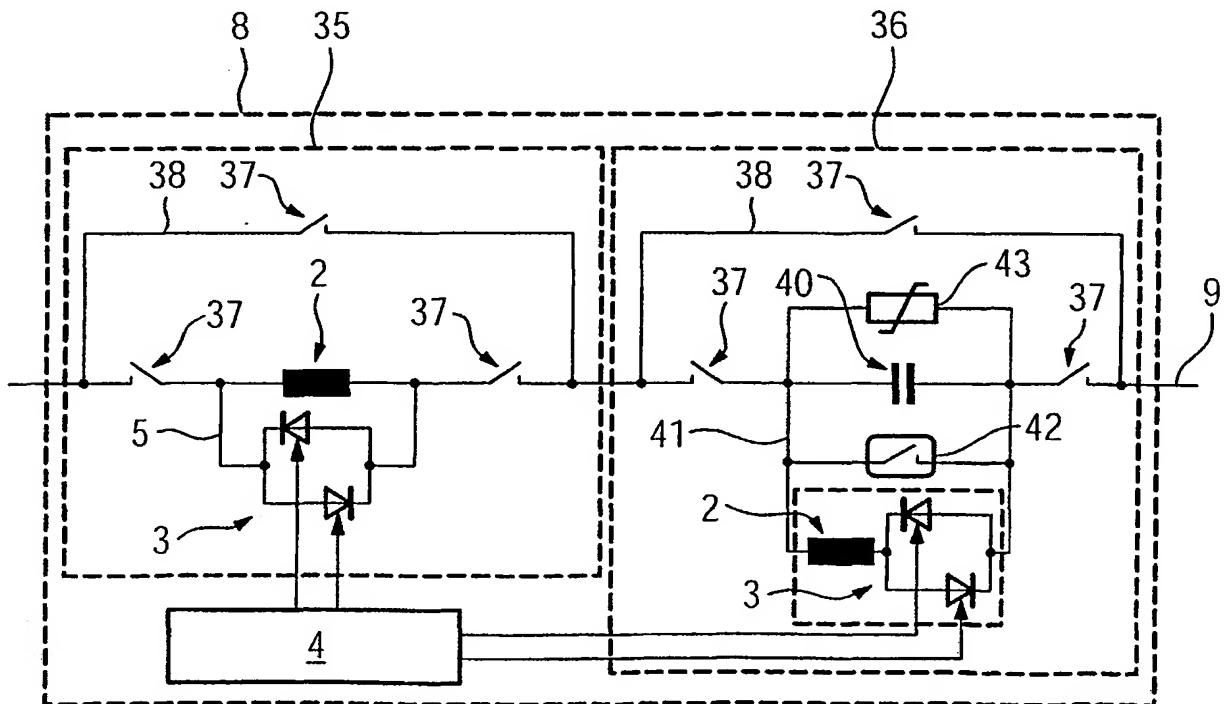


FIG 19



The diagram illustrates a power MOSFET driver circuit (4) and its associated feedback control system (30). The MOSFET (2) is connected to a load (22) and a power supply (9). The gate of the MOSFET is driven by a driver circuit (3) consisting of two MOSFETs (3a, 3b) and two diodes (17a, 17b). The driver circuit is controlled by a feedback system (30) that monitors the MOSFET's drain current (I<sub>on</sub>) and gate voltage (V<sub>on</sub>) and adjusts the gate drive accordingly.

The feedback system (30) includes a current sensor (12) that measures the drain current (I<sub>on</sub>) and a voltage sensor (15) that measures the gate voltage (V<sub>on</sub>). The current sensor output is processed by a current feedback block (13a) with gain  $\alpha_a$ . The voltage sensor output is processed by a voltage feedback block (13b) with gain  $\alpha_b$ . The outputs of these blocks are combined in a summing junction (16) to produce a control signal (17a, 17b) that drives the MOSFETs (3a, 3b).

The control system (30) is implemented in a digital or microcontroller-based architecture. It includes a central processing unit (27) that receives inputs from the current sensor (12) and the voltage sensor (15). The processing unit (27) is connected to a memory unit (29) and a control logic unit (20, 21). The control logic unit (20, 21) generates a control signal (25) that is fed back to the MOSFET gate (2) via a driver circuit (23, 24). The control logic unit also includes a feedback loop (26, 28) that monitors the MOSFET's performance and adjusts the control signal (25) accordingly.

The control logic unit (20, 21) includes a current feedback block (20) with gain  $K_I \cdot \frac{1+s \cdot T_I}{s \cdot T_I}$  and a voltage feedback block (21) with gain  $K_P \cdot \frac{1+s \cdot T_P}{s \cdot T_P}$ . The outputs of these blocks are combined in a summing junction (25) to produce a control signal (26) that is fed back to the MOSFET gate (2) via a driver circuit (23, 24). The control logic unit also includes a feedback loop (26, 28) that monitors the MOSFET's performance and adjusts the control signal (26) accordingly.

FIG 21

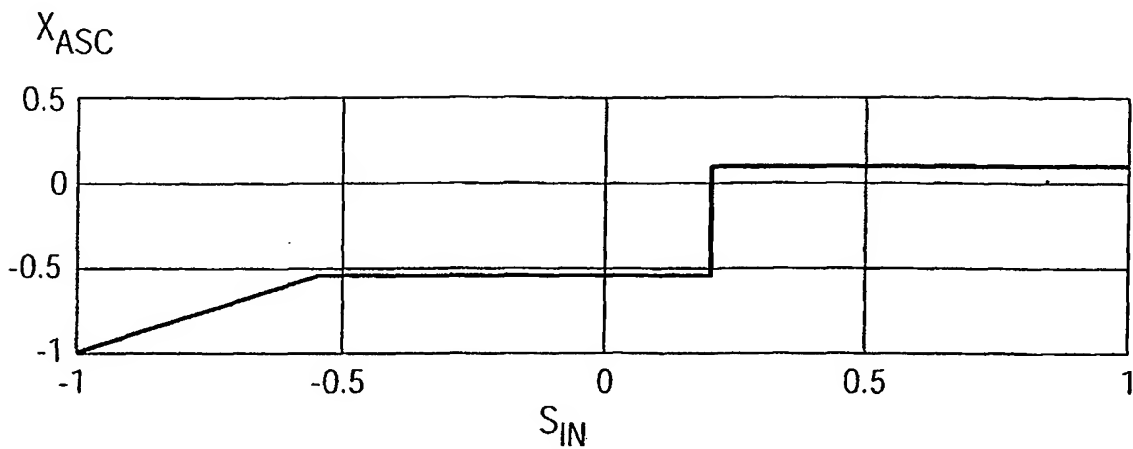


FIG 22

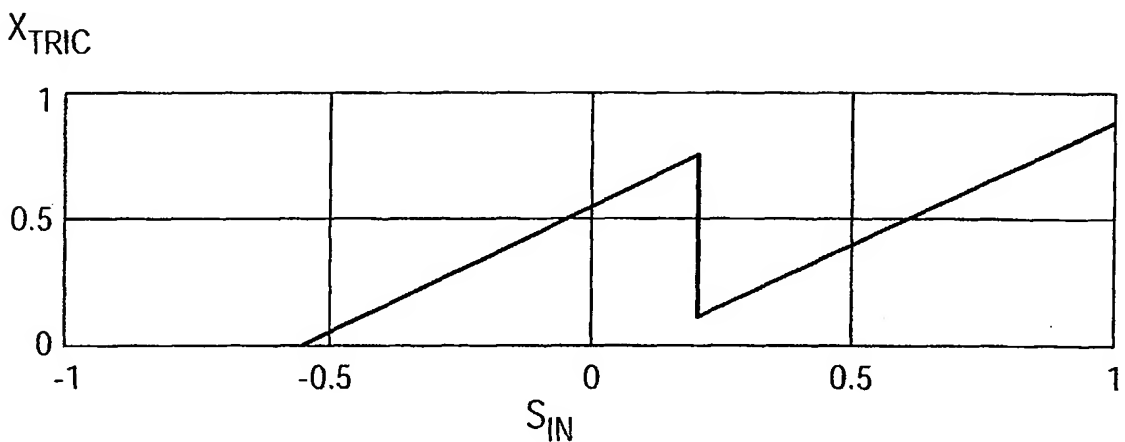
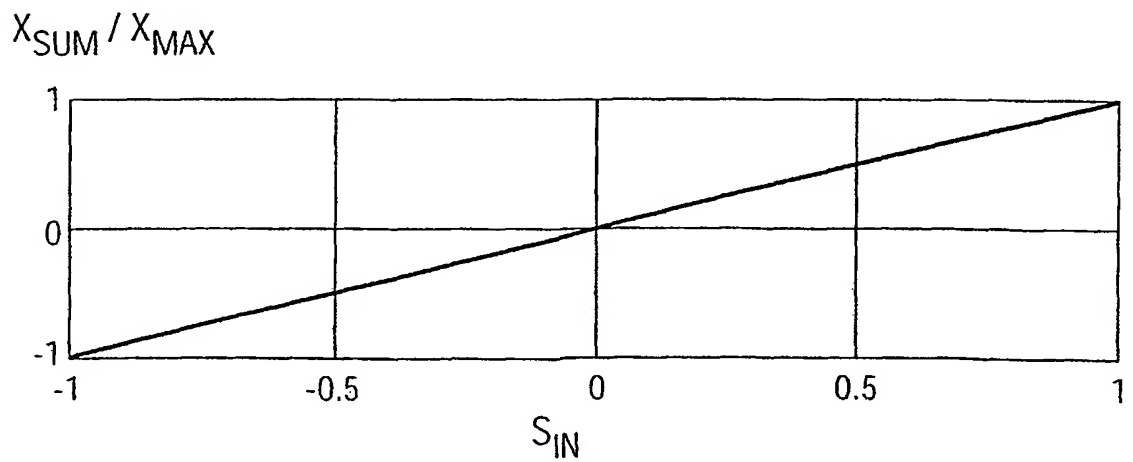


FIG 23



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